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Gerhard Aust

Vertical Cooperative Advertising in Supply Chain Management

A Game-Theoretic Analysis



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Vertical Cooperative Advertising in Supply Chain Management

A Game-Theoretic Analysis



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*To my beloved wife
Katja*

Foreword

Principally, the main idea of supply chain management is to collaborate with other firms along the supply chain in order to leverage strategic positioning and to improve operating efficiency. One possible facet of this collaboration—especially along a manufacturer-retailer-supply-chain—is cooperative advertising. While the manufacturer’s advertising strategy aims to create a brand image and is long-term oriented, the retailer concentrates on short-term oriented advertising by communicating prices and special offers to customers. The problem may occur that a single retailer is not able to bear local advertising expenditures at a height desired by the manufacturer. Therefore, it can absolutely be in the interest of the manufacturer to support the retailer’s advertising financially to increase sales by which the manufacturer profits in the end, too. Such a financial participation is called vertical cooperative advertising, a practice that is very common in a lot of manufacturer–retailer partnership programs.

This outstanding thesis is a cumulative dissertation consisting of four main papers. The first paper represents the first comprehensive literature review on cooperative advertising. This review comprises 110 scientific articles and gives an excellent overview of the state of the art in cooperative advertising. Within the other three papers, Gerhard Aust chooses a game-theoretic approach to analyze manufacturer–retailer supply chains which differ according to demand functions, structure, and distribution of power. He formulates comprehensive mathematical models to determine the advertising participation rate, retail and wholesale prices, local and global advertising expenditures, and profits.

The second paper considers a typical cooperative advertising situation with one manufacturer and one retailer. In contrast to previous articles, Gerhard Aust relaxes the restrictive assumption of identical margins for both players and applies a general demand function leading to differentiated results concerning dominant game structures. The third paper regards a supply chain which consists of one manufacturer and two retailers who sell substitutable products. It is the first time that a cooperative advertising program is applied to such a setting. It turns out that retail competition has harmful effects on each players’ profit. However, due to reduced retail prices, customers benefit from this additional competition. In the

fourth paper fuzzy set theory is applied for the first time to a single-manufacturer–single-retailer supply chain with cooperative advertising to incorporate uncertainty of demand parameters into analysis.

In summary, this dissertation is distinguished by extremely sophisticated mathematical models, intelligent and clean solutions, and detailed managerial interpretation. Moreover, it contributes significantly to understand and to improve cooperative advertising programs. Therefore, I hope that Gerhard Aust's excellent dissertation finds large distribution.

Prof. Dr. Udo Buscher

Acknowledgments

This cumulative PhD thesis was written during my time at the Chair of Business Management, especially Industrial Management, at the TU Dresden, where I have been working as a scientific assistant since 2011. I would like to use this opportunity to express my sincere gratitude to those who accompanied me during the last years.

First and foremost, I thank my supervisor, Prof. Dr. Udo Buscher. Already during my diploma thesis, he convinced me to take also the next academic step and to continue with my research. Despite many appointments and duties, he always offered me any possible support and feedback, whereby he significantly contributed to the success of my dissertation project. Besides all these professional aspects, I really value him personally, as he is always concerned with creating a friendly and pleasant working environment at our chair.

As every (current or former) PhD student knows, a dissertation can often be an all-consuming and even solitary work, making the colleagues all the more important. Without them, the time wouldn't have been as enjoyable as it was and is! Therefore, I am deeply indebted to Ina Bräuer, Kirsten Hoffmann, Birgit Keller, Janis Neufeld, and Carolin Witek for all those professional and nonprofessional discussions, the coffee and lunch breaks, the numerous cakes and—certainly less numerous—sparkling wines during our meetings, and even for those minor and major troubles with computers and printers, which always are a welcome diversion. Furthermore, my former colleague Dr. Christian Ullerich has to be mentioned in particular, not only for his critical and detailed proofreading of my thesis. Finally, I would like to thank Evelyn Krug, who relieves us from these administrative duties and truly is the heart of our team.

My greatest thanks go to my family. To my parents, Angelika and Gerhard, whose absolute support I can rely on in every circumstance and any decision of my life. I owe everything to you and it can hardly be expressed in words what you have done for me! And, last but not least, to my wife Katja, to whom I would like to dedicate this book. Without her endless patience, tolerance, and willingness to share all the

ups and downs and to talk about sometimes really ivory-tower problems even in late hours, this thesis would not have been possible.

Dresden, Germany

Gerhard Aust

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